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(54) **A casing for a roller shutter**

(57) A casing (1) for mounting a roller shutter (2), comprises a shaft (5) on which slats (3) can be rolled up which are hingedly linked together. The casing (1) comprises support means (10, 11, 19) for bearing the shaft (5) and mounting means (14, 23) attached to the support means (10, 11, 19) which bear the shaft (5). The mounting means (14, 23) are adjustable mounted on the support means (10, 11, 19).

In the invention the bearings can be mounted in a position in which the winding radius which depends on the overall length of the opening to be closed and hence the length of the roller shutter can be taken into consideration. In other words the casing and in particular the position of the bearings in the casing can be adapted to roller shutters of different length.

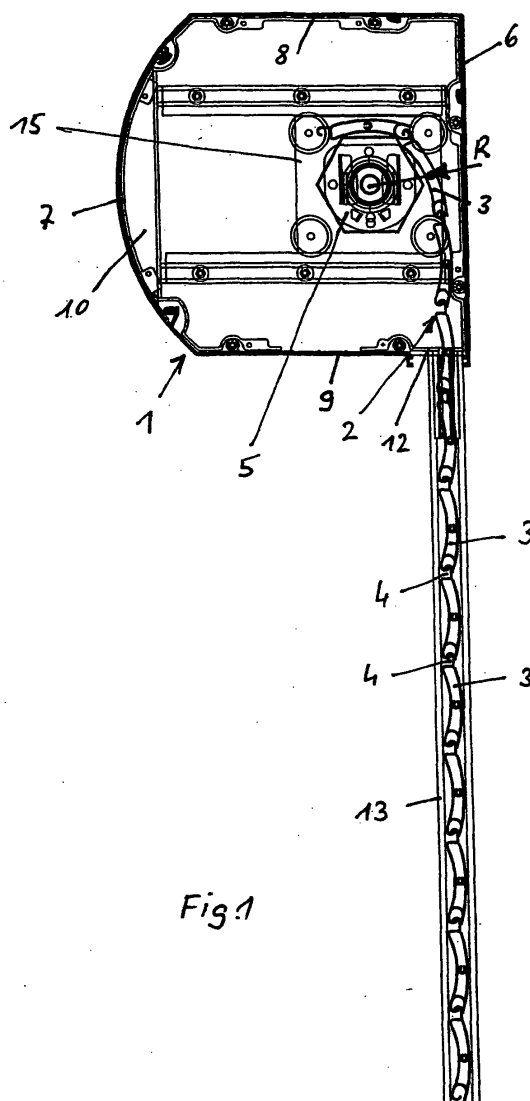


Fig. 1

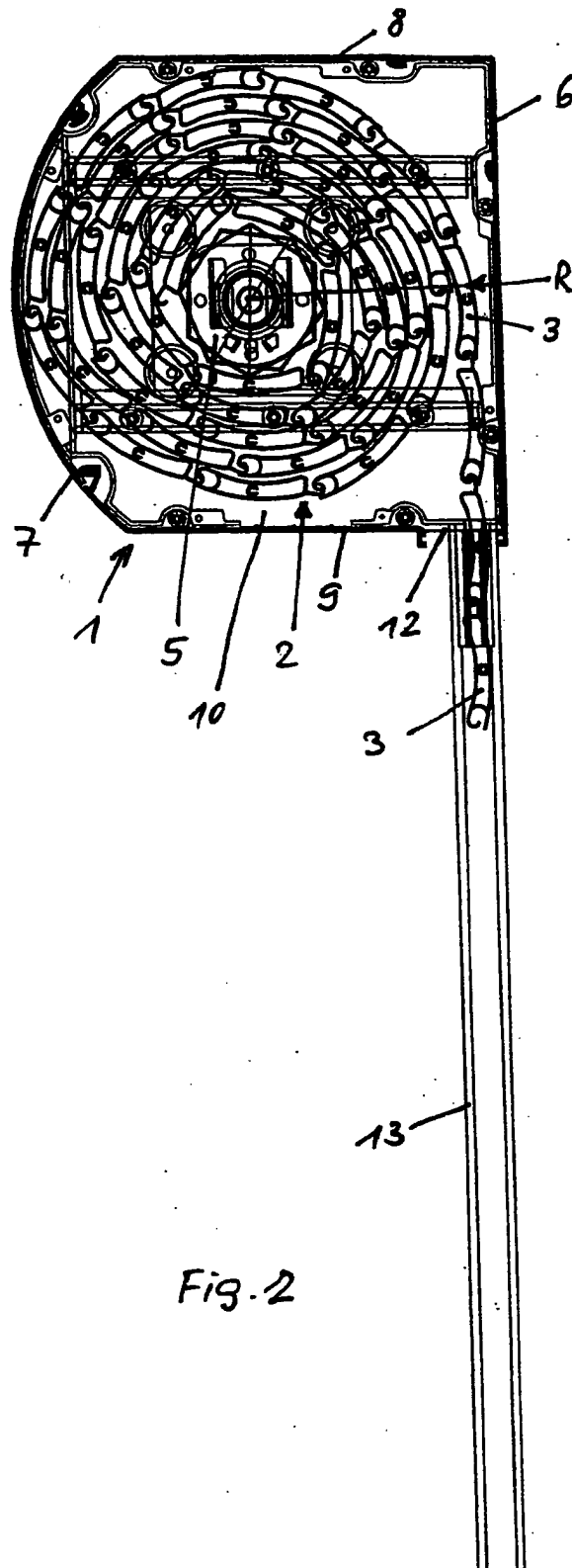


Fig. 2

Description

[0001] The invention concerns a casing for mounting a roller shutter, comprising a shaft on which slats can be rolled up which are hingedly linked together, support means for bearing the shaft, and mounting means attached to the support means and bearing the shaft.

[0002] Roller shutter are usually wound on a shaft located in a casing in order to move of the shutter upward and downward to open or close an opening in a wall of a building, for example a door or a window. The winding radius of the shutter is variable. The overall winding radius of the shutter is dependent on the vertical length of the door or window. Further the radius is changing while turning the shaft and moving the shutter upward and downward. The slats of the shutter are usually guided in rails which may be U-shaped and are located on both sides of the opening. For perfect operation the winding radius should be in line with the rails. This can be attained according to the state of the art only in exceptional cases, because the bearings are located in the centre of the casing to be able to wind up the maximal possible length of the roller shutter. Only in this case and when the roller shutter is in the totally raised position the winding radius is in line with the rails. In case the length of the roller shutter is shorter due to a shorter length of the opening the maximum possible length of the roller shutter the winding radius is never in line with the rails. This, however, increases the wear of the parts (the drive motor, the slats and the guiding means) of the roller shutter, the number of malfunctions or stoppages and the noise during operation.

[0003] It is therefore the general object of the invention to reduce these drawbacks of the state of the art.

[0004] To attain this the inventive a casing for mounting a roller shutter, comprising a shaft on which slats can be rolled up which are hingedly linked together, support means for bearing the shaft, and mounting means attached to the support means and bearing the shaft is characterized in that characterized in that the mounting means are adjustable mounted on the support means.

[0005] In the invention the bearings can be mounted in a position in which the winding radius which depends on the overall length of the opening to be closed and hence the length of the roller shutter can be taken into consideration. In other words the casing and in particular the position of the bearings in the casing can be adapted to roller shutters of different length.

[0006] In a first simple embodiment of the invention the mounting means can be fixed to the support means. In this case the bearings are fixed in position within the casing in which the maximum winding radius is in line with the rails.

[0007] One drawback of this embodiment is, that after partially or fully lowering the roller shutter the winding radius which then is smaller is not in line with the rails any more.

[0008] It is therefore another object of the invention to

provide a casing for mounting a roller shutter which automatically adapts itself to different winding radii even during operation of the roller shutter.

[0009] This can be achieved in designing the mounting means like a carriage which is movable along a track which is provided on the support means. During the raising and lowering operation of the roller shutter the winding radius of roller shutter in the casing is changing. As the bearings are movable on a track the distance of the axis of the shaft to a imaginary prolongation of the rails is adapted to the winding radius at every time and the roller shutter enters the rails always in perfect alignment with the rails.

[0010] The movement of the carriage is advantageously self adapting. This means that there is no drive for movement of the carriage along the track. The forces acting on the roller shutter moving in the rails usually will be sufficiently high to perform the movement of the carriage. When required there can also be a drive for this movement. This can be a drive which is separate form the drive for the winding operation of the roller shutter. Alternatively the drive for winding the roller shutter can also be used to perform the movement of the carriage on the track.

[0011] Other advantageous embodiments are defined in the other attached claims.

[0012] Other details, features and advantages of the invention follow from the description below for the embodiments of the invention which are shown in the drawings.

Fig. 1 shows a section of a casing of a roller shutter according to the invention with the roller shutter in the lowered position.

Fig. 2 shows a section of a casing of a roller shutter according to the invention with the roller shutter in the raised position.

Fig. 3a and Fig. 3b show the left and right side of an end cap of the casing with a fixed mounting means for the roller shutter.

Fig. 4a and Fig. 4b show the left and right side of an end cap of the casing with a movable mounting means for the roller shutter.

Fig. 5 shows the carriage of Fig. 4a.

Fig. 6 shows the carriage of Fig. 4b.

Fig. 7 shows the carriage of Fig. 6 mounted on a support means with track for the carriage.

Fig. 8 shows a support plate.

[0013] In Fig. 1 and 2 sections of an casing 1 for a roller shutter 2 according to the invention are depicted,

in which the roller shutter 2 is shown in a lowered and in a raised position. The roller shutter 2 comprises a plurality of slats 3 which are hingedly joined to each other along their adjacent long edges 4, one after the other. The roller shutter 2 is wound on a shaft 5 which is rotatably mounted in the casing 1. The casing 1 comprises a front wall 6, rear wall 7, top wall 8 and a bottom wall 9 as well as two side walls 10, 11. Adjacent to the front wall 6 is an opening 12 in the bottom wall 9 through which the roller shutter 2 extends into U-shaped rails 13 in which the slats 3 of the roller shutter 2 are guided. The rails 13 usually are attached on the sides of an opening, for example a window or a door which is to be closed by the roller shutter 2.

[0014] It can be seen in Fig. 1 and 2 that the winding radius R of the roller shutter 2, i.e. the radius of the outermost slats 3 which are wound on the shaft 5, is different in the positions of the roller shutter in Fig. 1 and 2.

[0015] For technical reasons the opening 12 and the rails 13 usually are very close to the front wall 6. Therefore in the state of the art an imaginary prolongation of the rails 13 would be in line with the winding radius R only in exceptional cases where the winding radius R purely by chance is a maximum in those cases where the vertical length of the opening demands for a maximum length of the roller shutter 2.

[0016] According to the invention, however, the shaft 5 of the roller shutter 2 is adjustable mounted in the casing 1 which allows to adapt the position of the shaft 5 for perfect alignment of the winding radius R of the roller shutter 2 with the imaginary prolongation of the rails 13. Thus the slats 3 enter and leave the rails 13 in straight alignment without rattling over the ends of the rails 13 or the edge of the opening 12 in the bottom wall 9.

[0017] The side walls 10, 11 can be designed as support means for mounting means 14 to which bearings of the shaft 5 are attached. Alternatively, e.g. for adaptation of other or already existing casings of roller shutters, the support means can be a separate part or plate 19 shown in Fig. 8 which can be attached to the side walls 10, 11 of the casing 1.

[0018] According to the embodiment of Fig. 1, 2 and 4 to 7 the mounting means 14 comprise a left carriage 15 moveable on a track 16 with lower rail 16a and upper rail 16b and a right carriage 17 moveable on a track 18 with lower rail 18a and upper rail 18b. The carriages 15, 17 each comprise four wheels 20 engaging the rails 16a, 16b and 18a, 18b, respectively. Due to the weight of that part of the roller shutter 2 which is not wound on the shaft 5 and thus hanging down from the shaft 5 and minor forces acting between the slats 3 of the roller shutter 2 and the rails 16 the carriages 15, 16 bearing the shaft 5 will move along the track 16, 18 in a direction essentially perpendicular to the orientation of the rails 13 in which the roller shutter 2 moves upward and downward. By that the slats 3 of the roller shutter 2 always will, dependent on the direction of movement, enter or leave the rails 13 in alignment with the orientation of the rails

13 thus avoiding undue wear or noise during operation. Malfunctions at the beginning of the lowering operation where the first slats 3 could become stuck due to the missing weight of slats 3 tearing the slats 13 down into the rails 13 are avoided as well because the first slats 3 enter the rails 13 in line with the orientation of the rails 13.

[0019] One carriage 15 comprises fastening means 21 for a drive for raising and lowering the roller shutter 2. The fastening means 21 at the same time is a bearing for the shaft 5. The other carriage 17 only comprises a bearing 22 for the shaft.

[0020] In another embodiment of the invention which is shown in Fig. 3a and 3b mounting means 23 are not displaceable but fixed to the side walls 10, 11 and the support means 19, respectively. One mounting means 23 again comprises a fastening means 24 and the other mounting means 23 a bearing 25. The support plate 19 has a small groove 26 which makes it easier to find the correct position of the mounting means 23, 24 and to fasten them to the support plate 19. The groove 26 can be used for example to provisionally fix the tip of a screw for positioning purposes of the mounting means 23 before the screw finally is screwed into the support plate 19.

[0021] This embodiment allows to consider different maximum winding radius R as it is principally shown in Fig. 2. In cases where the vertical length of the door or opening is shorter than the maximum length possible the maximum winding radius R is smaller as well due to the shorter roller shutter 2. In this case the mounting means 23 can be fixed closer to the imaginary prolongation of the rails 13 and at least the first or lowermost slats 3 enter the rails 13 in alignment with the rails thus avoiding that the first slats 3 become stuck at the beginning of the lowering operation as already mentioned above.

Claims

1. A casing (1) for mounting a roller shutter (2), comprising a shaft (5) on which slats (3) can be rolled up which are hingedly linked together, support means (10, 11, 19) for bearing the shaft (5), and mounting means (14, 23) attached to the support means (10, 11, 19) and bearing the shaft (5), **characterized in that** the mounting means (14, 23) are adjustable mounted on the support means (10, 11, 19).
2. A casing according to claim 1, **characterized in that** the mounting means (14, 23) can be fixed to the support means (10, 11, 19).
3. A casing according to claim 1, **characterized in that** the mounting means (14, 23) are displaceable mounted to the support means (10, 11, 19).

4. A casing according to claim 3, **characterized in that** the mounting means (14, 23) is a carriage (15, 17) which is movable along a track (16a, 16b, 18a, 18b) on the support means (10, 11, 19). 5
5. A casing according to claim 4, **characterized in that** the support means (10, 11, 19) comprise a support plate (19) which comprises the track (16a, 16b, 18a, 18b). 10
6. A casing according to claim 4 or 5, **characterized in that** the carriage (15, 17) comprises wheels (20) which engage the track (16a, 16b, 18a, 18b). 15
7. A casing according to one of claims 1 to 6, **characterized in that** the mounting means (14, 23) are adjustable in a direction essentially perpendicular to the direction of movement of the roller shutter (2) upward and downward. 20
8. A casing according to one of claims 1 to 7, **characterized in that** a drive for the shaft (5) is mounted on the mounting means (14, 23). 25
9. A casing according to one of claims 5 to 8, **characterized in that** the support means (19) is attachable to the casing (1). 30
10. A casing according to one of claims 5 to 9, **characterized in that** the support plate (19) has a small groove (26) extending essentially perpendicular to the direction of movement of the roller shutter (2) upward and downward. 35

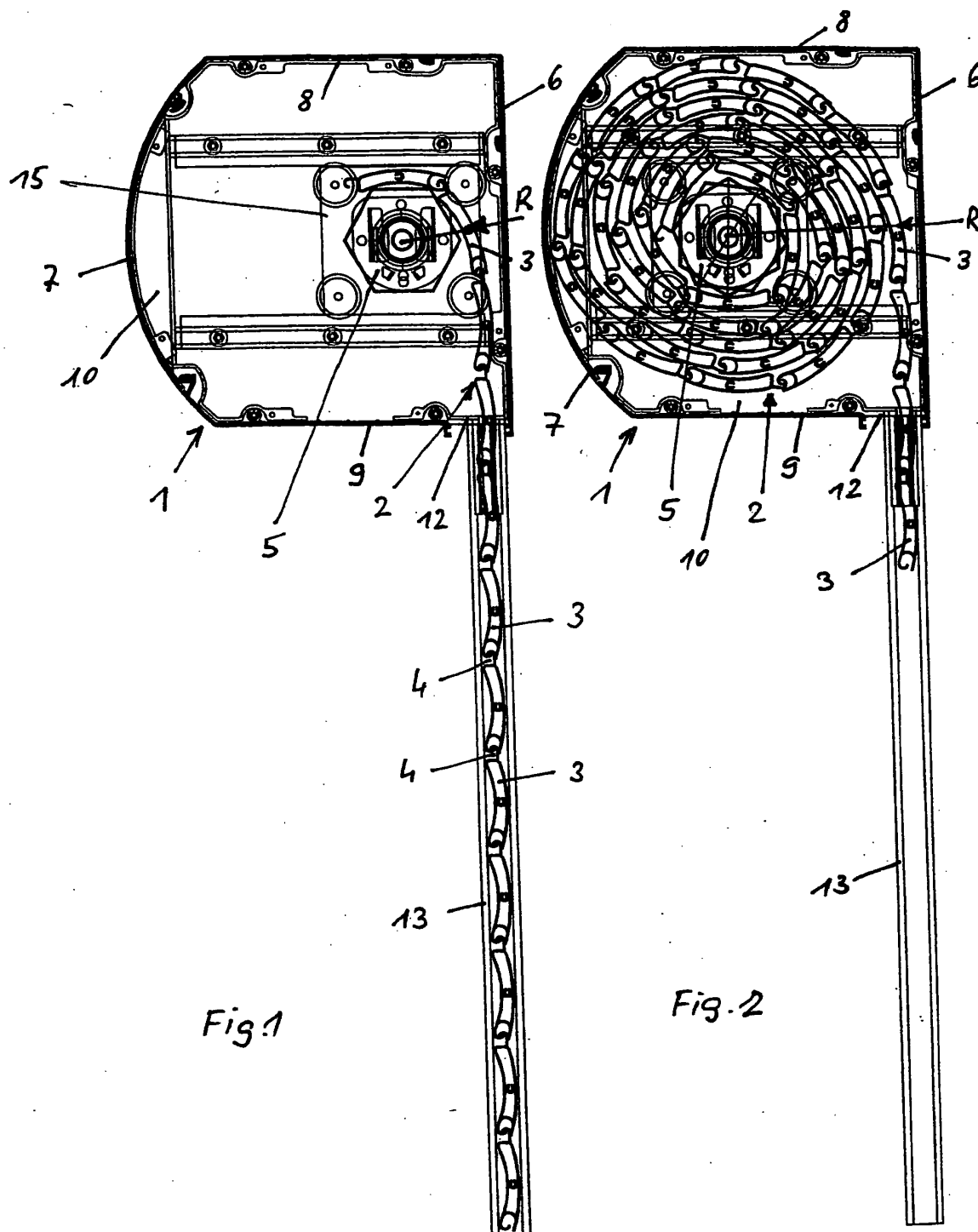
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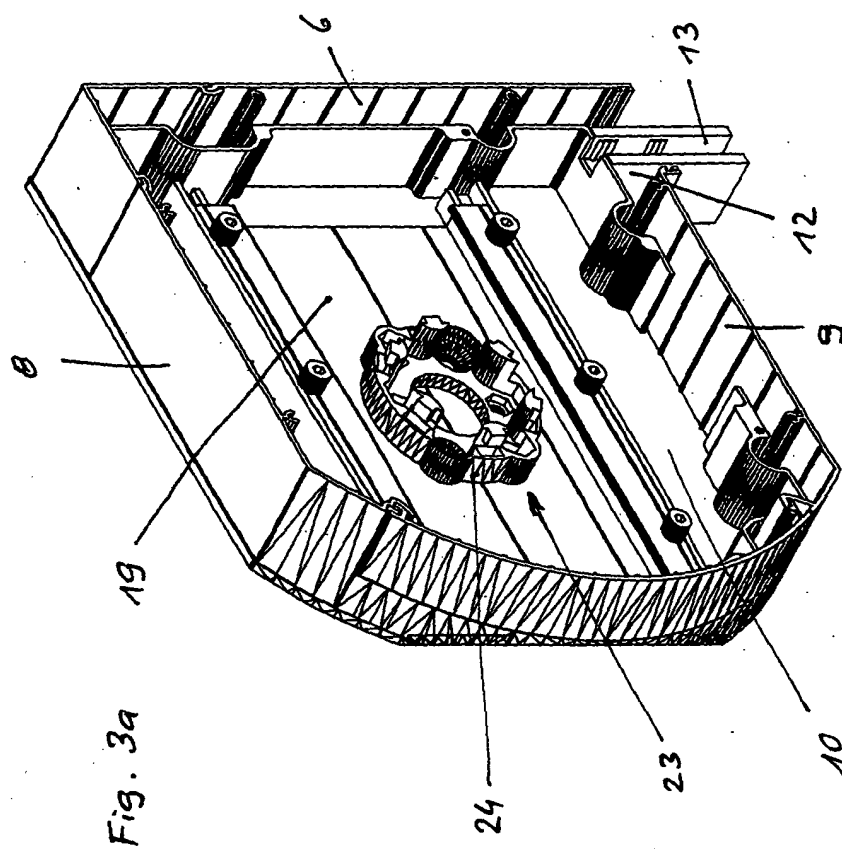
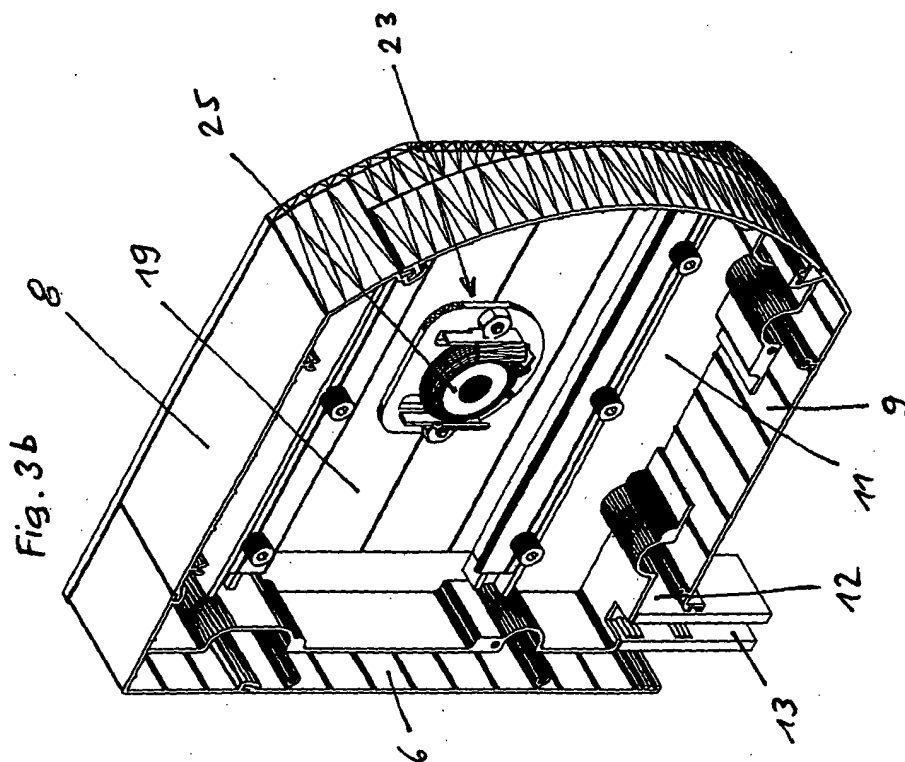
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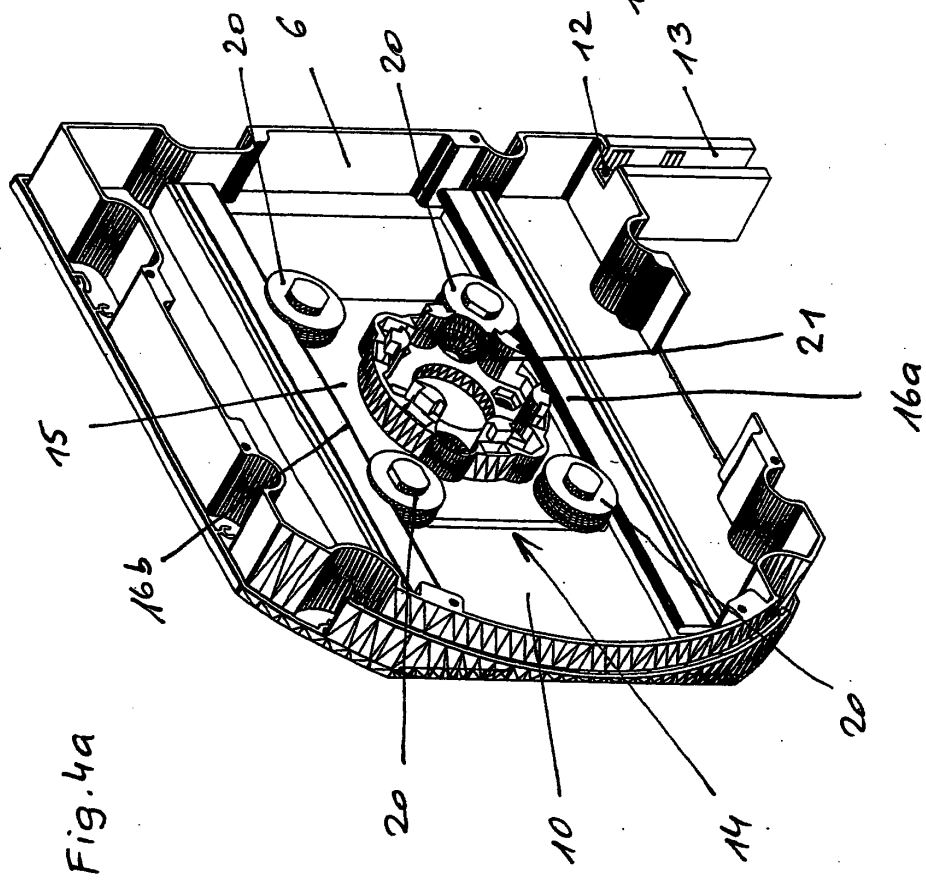
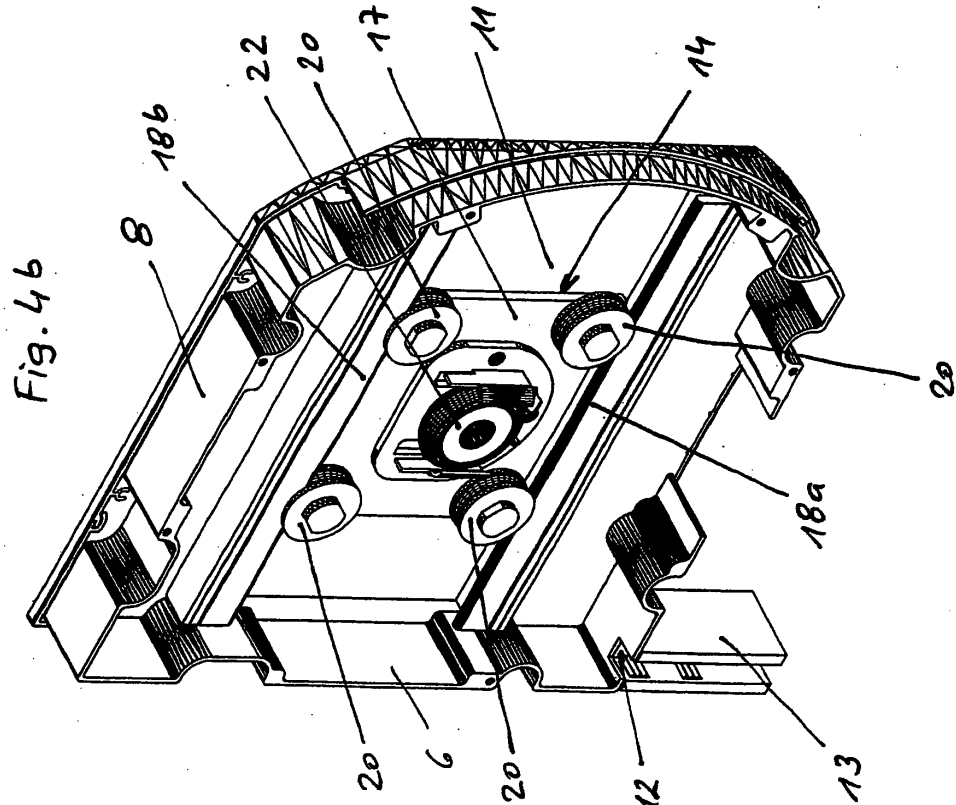
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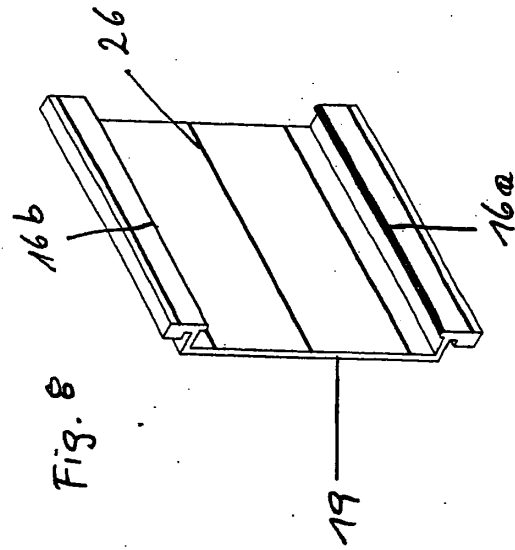
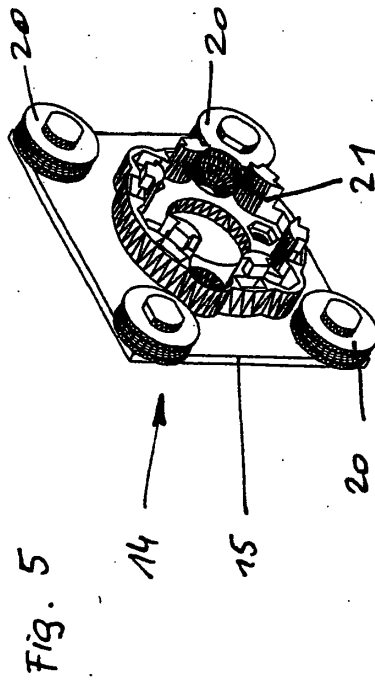
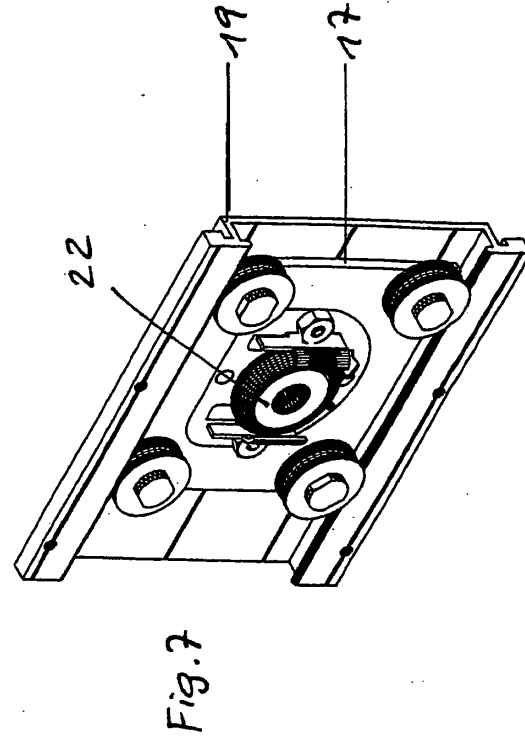
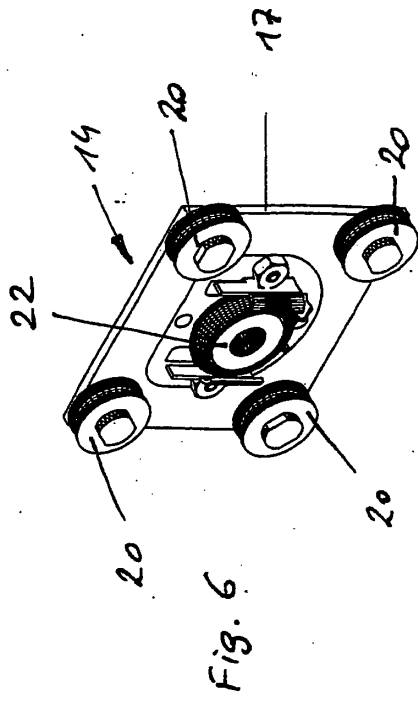
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EUROPEAN SEARCH REPORT

Application Number
EP 03 02 1808

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The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 3 March 2004	Examiner Merz, W
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